

Seeing colored objects

Do you remember glass prism ?!

The seven light colors are:

Red	Orange	yellow	Green	blue	indigo	violet
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When the seven light colors are mixed together, the white light is produced.

Activity 1

How to prove that mixing the seven light spectrum colors produces the white light.

Observation:

the colored disk seems white.

Inference:

Mixing the seven light spectrum colors produces the white light.



Seeing the colored objects

We can see colors and colored objects because the white light composed of seven spectrum colors.

1- Seeing the colored transparent and colored translucent objects.

The transparent objects allow light to pass through them.

When the white light strike the colored transparent object, this object absorbs all colors of light and permits its own color only to pass through it.

So,

The color of the transparent objects is the same color of the transmitted light through them.

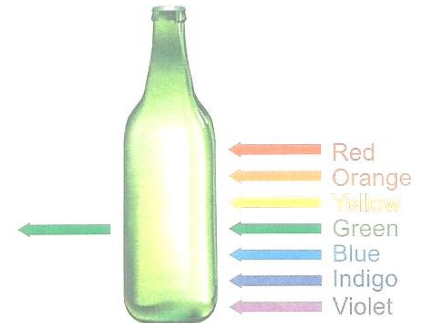
Example

Green transparent glass bottle.

When you look at this glass bottle, it seems green in color.

The reason:

The bottle absorbs all the light colors and allows the green light only to transmit through it.



2- Seeing the colored opaque objects

** The opaque objects don't allow light to transmit through them.

** The opaque objects are divided into:

A- white objects	B- black objects	C- Colored objects
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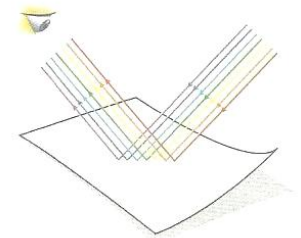
A – Seeing white objects:

When white light strikes the white opaque object, the object reflects all the light colors.

So, white opaque body appears with the same color of light that falls on it.

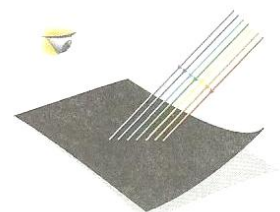


We can see the white paper as it is.
Because the white paper reflects all the light colors.

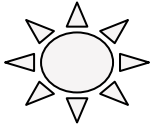


B – Seeing the black objects.

When white light strikes the black opaque object, this object absorbs all the light colors.



So, the black object appears black because it absorbs any light color on it.



We must wear black (dark) clothes in winter ?!

Because black clothes absorb all light colors that fall on it causing The feeling of warmth.

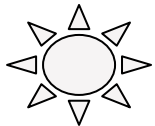
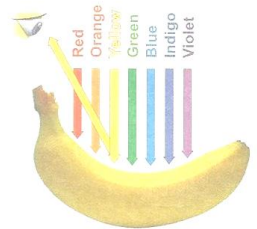
C – Seeing the colored opaque objects

When the white light strikes the colored opaque object, it absorbs all the light colors and reflects its own color only.

So, the color of the opaque object is the color of the reflected light.

Example: Banana fruit seems yellow in color.

** Because it absorbs all the light colors and reflects the yellow color only.



How can you see the colored opaque objects through colored transparent objects?

Activity

Steps:

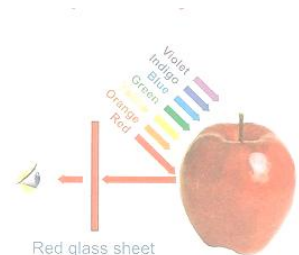
Put a red apple behind: red \ green \ blue transparent glass sheet.

Look at the red apple through each glass sheet.

Observation

** apple appears red when you look at it from the red transparent glass sheet.

** apple appears with no color (black) when you look at it from the green and blue transparent glass sheets.



Explanation:

The apple appears red because the apple absorbs all the light colors and reflect the red light only.

The reflected red light strikes the transparent glass sheet and transmits through it, then reaches our eyes.

The apple appears with no color (black) through the green and the blue glass sheets, because the reflected red light from the apple is absorbed by green and blue glass sheets and doesn't transmit through them.

Inference:

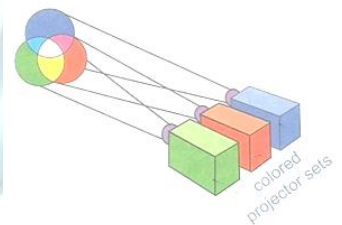
The opaque object is seen in its real color when you look at it through a transparent object that has the same color.

Mixing the colored lights

** We use three colored projector sets (red, green and blue)

** when the three sets send out the light on a white screen.

** Red, green and blue colors are called "**the primary colored lights**"



Primary colored lights:

They are colored lights which impossible to be produced by mixing two of the other colored lights.

** mixing all the primary colored lights (red, green and blue) gives the white light.

** the colored lights that can be produced by mixing any two of the primary colored lights are called (secondary colored lights))

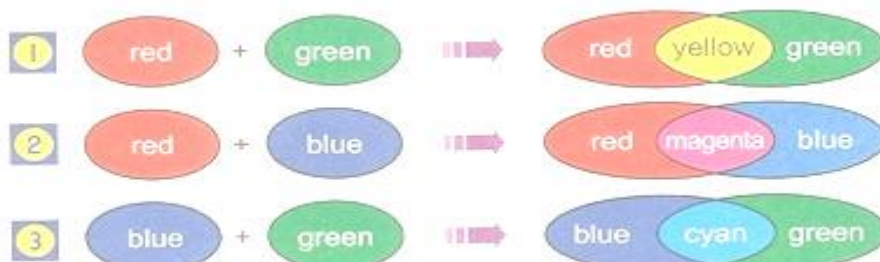
** the secondary colored lights are Yellow , magenta (purple) and cyan.



Secondary colored lights:

They are colored lights that are produced by mixing two of the primary colored lights.

Examples: mixing two of the primary colored lights to produce one secondary colored light.



Points of comparison	Primary colored lights	Secondary colored lights
Definition	Colored lights which impossible to be produced by mixing two of the other colored lights.	Colored lights that are produced by mixing tow to the primary colored lights.
Examples	Red, green and blue.	Yellow, magenta and cyan.

Do you know?

- sunlight consists of seven light colors.
- Mixing colors gives different colors.
- Red, blue and yellow are the basic colored paints.

Vocabulary

Mixing	خلط	Protractor	برجل
Rotate	يلف	Scissors	مقص
Strike	يخترق	Absorb	يمتص
Permit	يسمح	Sheet	لوح
Reflected	منعكس	Real color	لون حقيقي
Projector sets	اجهزة العرض	Spots	بقعة
Impossible	مستحيل	Send out	يرسل
Cyan	ازرق سماوي	Magenta	احمر قرمزي
Basic	اساسي	paints	دهانات

Questions on lesson 2

- 1- the prism separates the sunlight into
- 2- Orange and are the first three light colors.
- 3- The transparent colored objects have the same color of the
- 4- When a white light falls on a transparent red bottle, the bottle absorbsand permits the To pass through.
- 5- The only light color which transmits through a transparent violet body is light.
- 6- All the light colors are when they fall on a white opaque body.
- 7- The white paper appears white, because.....
- 8- The whiteboard All the light colors, while the blackboard all the light colors.
- 9- We must wear Clothes in summer season and clothes in winter season.
- 10-When the white light strikes the green grass, he grass absorbs and reflects light only.
- 11- The banana fruit seems yellow, because it and yellow light only.
- 12- object absorbs all the light colors, while object absorbs all light colors and reflects its own color only.
- 13-The red apple appears when you look at it from a transparent red glass sheet and appears When you look at it through a transparent green glass sheet.

14-If the red light strikes a white ball, the ball looks in color.

15-When you look at a red apple through a yellow glass sheet, it seems

16-Red light + green light +blue light =

17- , And are the primary colored lights.

18-Mixing all the primary colored lights together gives

19-..... , And are called the secondary colored lights.

20- mixing and lights produces yellow light.

21- mixing red and green lights gives Light.

My wishes, Mr. Ibrahim Elsayed

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